DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY BOARD
4800 MARK CENTER DRIVE, SUITE 16E12
ALEXANDRIA, VIRGINIA 22350-3606

16 JAN 2025

DDESB-PE

MEMORANDUM FOR DIRECTOR, U.S. ARMY DEFENSE AMMUNITION CENTER
(ATTENTION: ATCL-ACE)

SUBJECT: DDESB Approval of 3-Bar Structural Strength Designation for the ARMAG Steel-Box Earth-Covered Magazine (ECM) Design

References:
(a) U.S. Army Defense Ammunition Center ATCL-ACE (385-10b) Memorandum, 7 June 2023, Subject: Request Review and Approval of ARMAG Steel-Box, Earth-Covered Magazine (ECM) Design Inclusion into Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 15, Approved Protective Construction

(b) ARMAG Corporation Design Drawings "3-BAR EARTHEN COVERED TYPE 2 MAGAZINE SHIPPING AND INSTALLATION INFORMATION", Drawing Number S1412, dated 17 December 2024

(c) ARMAG Corporation Design Drawings "40' X 13'-6" X 9' 3-BAR EARTHENCOVERED TYPE 2 MAGAZINE", Drawing Number S1413, dated 17 December 2024

(d) E-mail from Mr. John Nevels (CEHNC), 28 April 2023, FW: ARMAG 3-Bar ECM Revised Drawings, Design, and CEHNC Memo Technical Concurrence

(e) E-mail from Mr. John Nevels (CEHNC), 30 August 2024, Subject: RE: Revised ARMAG 3-Bar ECM analysis report

(f) Email from Mr. John Nevels (CEHNC), 17 December 2024, Subject: RE: Revised ARMAG 3-Bar ECM analysis report

(g) Defense Explosives Safety Regulation 6055.09, Edition 1, Change 1, 23 February 2024

(h) DDESB Technical Paper 15, "Approved Protective Construction," Revision 4, 26 July 2020

As requested by reference (a) and supplemented or clarified by references (b) through (f), the reference (c) ECM design has been reviewed with respect to the explosives safety requirements of reference (g). Based on the information furnished, the ARMAG Steel-Box ECM design, as specified in the drawing set identified in reference (b) and (c), is approved as a 3-Bar ECM. This approval is based on the following:

a. The ARMAG Steel Box ECM design is approved for a 3-bar structural strength designation. The reference (a) submission demonstrates that the magazine will adequately withstand the design loading specified in V2.E5.5.2.4 of reference (g).

b. Per references (a) through (f):

(1) The approved net explosives weight (NEW) is limited to 50,000-lbs due to the reduced footprint of the magazine (13.5 ft X 40 ft).

(2) The hinges and latch of the blast door do not contribute to the blast resistance of the door system, per the design calculations in Appendix A of reference (a).

(3) The ARMAG will be bonded and grounded in accordance with the requirements of paragraph V2.E4.2. of reference (g).

(4) The minimum earth cover over the top of a magazine shall be maintained at 2-ft. The maximum slope must be maintained at 2 horizontal to 1 vertical.

c. The design of reference (b) and (c) will be added to Table AP1-1 of reference (h) as approved for new construction.

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